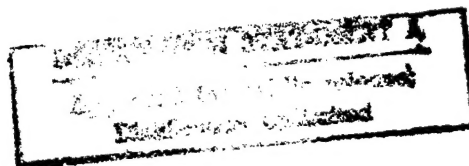


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10 November 1982



Worldwide Report

TELECOMMUNICATIONS POLICY,
RESEARCH AND DEVELOPMENT

No. 247

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FOREIGN BROADCAST INFORMATION SERVICE

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ITU FOCUSES ON FREQUENCY ALLOCATION PROBLEMS

AB261156 Lagos NAN in English 1130 GMT 25 Oct 82

[NAN feature: "Sharing the World's Airwaves," by James Bello, NAN correspondent in Nairobi]

[Text] One of the issues commanding the attention of the International Telecommunication Union (ITU) conference in Nairobi is whether Israel should be expelled or not. The United States has threatened to suspend financial subsidies if Israel, its protegy, goes, and countries such as Britain have appealed to the angry Arab nations to contain their anger by merely condemning Israel for its adventure in Lebanon.

But while the Israeli presence is a controversial issue, perhaps what is more fundamental and of profound relevance to the more than 1,000 delegates from the 150 member-countries is the question of control of the world's air waves.

The union, until recently, has always been an exclusive club of the major industrialized nations, and includes such ideological incompatibles as the United States and the USSR. This has made for a situation where the world of communications has developed without any Third World representation, despite the fact that the majority of the world's people live in the Third World.

Nigeria's communications minister, Audu Ogbah, who is the leader of Nigeria's delegation to the conference, has described the situation as keeping the developing nations at a perpetual technological disadvantage. He termed it unfair, where a very limited resource is entirely dominated by more powerful nations because they possess the technology to develop and share transmitters.

One question the Nairobi conference has clearly brought into focus is, whether the developed nations will continue to monopolize 80 percent of the world's air waves to the disadvantage of developing nations.

The Group of 77, made up of Third World states in the union, thinks that the world is so intricately interwoven and interdependent that what goes on in the Third World affects the developed nations, to the extent that there can be little room for indifference.

It is therefore not surprising that as far as the Group of 77 is concerned, the allocation of frequency bands is central to their deliberations. Algeria, Indonesia, Nigeria, Venezuela, Zimbabwe, Tunisia and Yugoslavia appear to be extremely vocal on this issue. Almost all the Third World countries at the

conference are also jostling for places in the union's Frequency Regulation Board (FRB), a body responsible for allocation of frequency bands to countries to use in broadcasting.

Since the present available technology allows for the use of only a limited number of frequencies, nations have to almost fight to get them. But the Third World has up to now been at a disadvantage in this struggle. This is because primarily, negotiations are rather technical, and secondly, because the allocations are made on the basis of the country's technological ability to utilize them. Thus, the technologically-advanced United States, Soviet Union and Britain dominate the world's air waves.

A case in point is the external service of the Voice of Nigeria broadcasts to east Africa on the 15.185 frequency. Listeners in Nairobi are extremely familiar with how the Voice of America unendingly interferes with these broadcasts.

At the moment the control over frequencies seems to be moving into particularly perilous straits. This is because satellite communications systems--some of which are owned by private corporations and states--have become the main form of filling the air waves. Yet, almost all of these are controlled by Western countries and the Soviet Union.

But even the few countries outside the industrialized West who are renting space in these communications systems do not have much control over their operations. According to the leader of the Chinese delegation, who is also his country's vice-minister for posts and telecommunications, Zi Yukui: "This state of affairs should not be left to continue if the Third World is to use modern communications not only for educational purposes, but for development and communicating effectively with the rest of the world."

In the view of Nigeria's communications minister, it is in the interest of the developed nations to make sure that they give greater attention to telecommunications problems of the Third World. It is a well-known fact that the development of telecommunications in the Third World would mean better business for the industrialized nations and greater access to Third World resources.

Yet, it is clear that many Third World governments have not come to terms with their potential, nor are they able to exploit the communications revolution. After all, the setting up of radio stations, telex and telephone systems, television stations and other ancilliary communication structures for a country is not a mere luxury. Indeed, it is one of the key instruments that must be secured for viable nation-building.

CSO: 5500/20

BRITISH TELETEXT SYSTEM WINS GOVERNMENT OK FOR AUSTRALIAN TV

Canberra THE AUSTRALIAN in English 27 Sep 82 p 22

[Article by Ted Knez]

[Text] THE Federal Government yesterday took a big step towards turning the country into a plugged-in, switched-on society with access to instant, push-button information.

It approved a British system, UK Teletext, for adoption by television stations as Australia's official broadcast information service.

The move, announced yesterday by the Minister for Communications, Mr Brown, paves the way for one of the most radical transformations in television viewing since the introduction of color almost a decade ago.

Mr Brown said the decision would enable the broadcasting industry to "plan with confidence" knowing the Government endorsed and encouraged the development of teletext.

He also said the service would be free to viewers except for the \$300 to \$500 cost of a television adaptor to receive information broadcasts.

"This decision will give extra impetus to the wider use of television as a communication medium," Mr Brown said.

"Continuing development of

teletext will enable far more information to be conveyed by television — and when the viewer wants it."

Mr Brown said teletext would provide viewers with an "impressive array" of up-to-date information at the touch of a button whenever the viewer wanted it.

News bulletins, weather reports, transport timetables, stockmarket reports, film details, quizzes, medical safety measures, community news, sport and the latest race results were normally available instantly.

"For example, viewers watching television can be alerted to news flashes by messages automatically appearing on the bottom of the screen," Mr Brown said.

"They can then, if they wish, switch over from their television program and call up the latest bulletin via Teletext which is then printed on the screen.

"Having read the printed words on the screen they can then switch back to the television program or call up other pages of teletext information.

"Punters need not leave

their chairs to find out by teletext the latest racing information and results.

"Viewers can work out household budgets from detail provided by teletext before going out to shop."

Mr Brown said the Government's decision to endorse UK Teletext followed trial operation of teletext services by television stations, announced in 1980, and a subsequent review of the trials by his Department.

"Viewers wanting to receive teletext services must buy a special decoding device to attach to an existing television set, or buy a set with a built-in decoder," he said.

"Apart from buying a decoder, teletext is a free service and viewers do not have to subscribe to the service. This is so because it is broadcast in the same way as usual television programs."

He said the Government was aware that teletext systems, other than UK Teletext, were under development overseas, and they would be watched with interest with a view to possibly introducing them here in future.

CSO: 5500/7508

PRIVATE SECTOR SEEN AS PRIME MOVER IN DATA NETWORKS

Canberra THE AUSTRALIAN in English 27 Sep 82 p 12

[Text]

DEVELOPMENT of Australia's electronic information networks will be done mainly by the private sector, according to an official of the National Library of Australia.

The assistant director-general (technical services), Mr Bryan Yates, said the private sector would be attracted to the profits from selling "re-packaged high-use" data.

Financial constraints on the public sector prevent it from providing the risk capital needed to put information it collects into a readily discernable and mass consumable form suitable for high-use data bases. The present data networks were excluding the majority and servicing specialised markets.

In most cases this information was bibliographic and referred to sources of information rather than supplying it.

More users would look to networks supplying real time information — facts, figures, and digests — which were ready for use.

"The National Library welcomes the private sector developments and sees the totality of usable and used information increasing through them," he said.

"Unfortunately, this will lead to profitability being the prime criteria for the running of a data base.

"Some of these (unprofitable) data bases could be essential to Australia and a subsidy or some other method would have to be found to keep them going."

The National Library's view was that it would

make the data bases it created available at commercial rates and on a non-exclusive basis to any commercial operator.

Mr Yates said the library's first priority was development of its Australian Bibliographic Network, which had been established in November 1981, to meet demonstrated needs of Australian libraries.

The network had already proved its viability, he said.

"The data base will be enhanced and the network is likely to consist of a central data base for on-line cataloguing, enquiries and union catalogue functions.

"It will ultimately have interfaces with other computer-based networks."

The company has already had preliminary talks with Australia's largest videotex group, Computer Power.

TELECOM'S DATA-SWITCHING SERVICE TO FOLLOW FRENCH MODEL

Canberra THE AUSTRALIAN in English 27 Sep 82 p 16

[Text]

TELECOM's new packet-switching service, Austpac, will begin to revolutionise information processing in business offices around Australia from December.

The service will make all aspects of distributed communications more economically feasible, including such relatively new techniques as electronic mail and electronic funds transfer.

It is a revolution that is well under way in Europe, where 17 countries already have operating or planned public packet-switched data services.

In Australia, Telecom's plans to provide the network by the end of this year are proceeding smoothly.

The DPS25 packet-switching system, designed and manufactured by Sesa of France, has been selected to implement Austpac.

As in the French Transpac network, where suppliers Sesa and DPS25 have a proven track record, Austpac will also use Honeywell DPS 6. The system owes much of its development to the significant experience gained by Sesa in its implementation of the Transpac packet-switching network for the French Post and Telecommunications Administration.

It also builds on Sesa's expertise in the operational DPS25 networks of the European space agency, French Railways Board and the Luxembourg Telecommunications System.

Demand for these networks has been heavy. By the end of last January, according to Mr Paul Guinaudeau of the

French Centre National Detudes de Telecommunications, Transpac had about 5500 direct user connections including more than 4200 x .25 connections.

Sesa's track record has been reinforced by the success of DPS25, a distributed architecture system comprising Honeywell DPS 6 computers and multiple micro-computers.

Australian manufacturer, Standard Telephones and Cables Pty Ltd, will provide cabling, power supplies and board repair facilities for the system.

The order from Sesa for Austpac nodes comprises four level 6/43s, three to be delivered immediately into Telecom's Melbourne computer complex and the fourth to be held in reserve.

Of the three initial configurations, one level 6/43 will collect accounting data from Austpac and the other two will comprise the network management centre which will handle subscriber connections and provide internal network control.

Reflected in the choice of the DPS 6, according to Honeywell consultant, Mr Rex Lehmann, is the company's rigid conformation to the International Standards Organisation's open systems architectural reference model and its extensive experience in installed networks for customers throughout the world.

Sesa was chosen, according to the product engineering manager of Telecom's packet-switching network group, Mr John Harrison, in part because it met the tender requirements of being the least

expensive technically-suitable system available.

But there was one other requirement in this tender — that it be a working system able to be delivered in a relatively short timetable, Mr Harrison said.

Sesa has built two large networks, Transpac and the Euronet network of the European Economic Community.

It has also sold public networks to Luxembourg, New Zealand, Brazil and Finland and has sold large private networks in the US through Sesa-Honeywell, including a network for the Chase Manhattan Bank.

Mr Harrison said the fact that Australia was just beginning its network at a time when many others had already been established throughout the world was no reflection on the country's technological advancement.

From its beginning until today, the public packet-switching story is only about five years old, he said.

But there was no doubt the network would revolutionise the way organisations managed their businesses in Australia.

As organisations begin to progress towards the paperless office, packet-switching will provide an answer, Mr Harrison said.

Austpac tariffs are independent of distance and make it possible to afford switched data communications anywhere. Long-term implications are even more revolutionary.

As demand became evident, Mr Harrison said Telecom planned to establish an interface to the telex network, allowing users to communicate across both networks.

In addition, such a connection would pave the way for Austpac users to communicate directly with international telex users.

Austpac is really about two things, Mr Harrison said. It will be of benefit to users who want to use their single terminal to call different host computers, irrespective of make.

These people will have a real data-switching requirement. It will also be of help to those customers who do not know exactly what network they will require in the next six months.

To configure and reconfigure a network, or to buy a consultant to do it, is costly. And to get private line circuits, especially if you require them around the country, takes time.

What Austpac offers is a completely pre-provided network, which you can access just by making a call.

In addition, in a private network, it is most often the computer manufacturer which handles the customers problems in terms of data flow and where it is to go, builds the customer's network, selects equipment and possibly even issues the order for data lines from Telecom and then leaves when delivery is completed.

Mr Harrison added that if the customer wanted to change suppliers, he had to call in a consultant or another computing company.

With Austpac, the customer can have the major part of his private networking problems handled by Telecom as part of its operation of the public network.

DIGITAL LOCAL COMMUNICATIONS NETWORK GROWING RAPIDLY

Canberra THE AUSTRALIAN in English 27 Sep 82 p 17

[Text]

ABOUT 80 per cent of all communications in data processing is with the local environment and 20 per cent is between sites, according to Digital Equipment Australia.

"The percentage of local communications will grow because organisations are buying computing equipment for use within facilities at a faster rate than they are expanding the number of sites," said a spokesman for the company.

As a consequence, there is a need to simplify connections, reduce overhead loads of handling network traffic, and to increase price and performance of connections.

Digital pioneered distributed computing and has become a leader in networking with its digital network architecture (DNA) which was developed to:

PRESENT a framework for consistent product development.

PROVIDE flexibility to respond to market needs and changes.

ALLOW co-existence of multiple types of systems.

PROTECT customer application investments.

ALLOW for new technology, in particular new protocols and new physical ways of connecting systems together.

The accepted definition of a local area network, according to Digital, is a data communications network, typically a packet communication net-

work, limited in geographic scope.

Said the spokesman: "What is needed is a high-speed, general purpose network optimised for digital connection technology."

"The goals of such a network are bandwidth sufficient to meet performance requirements, reliability, low cost and simple, and flexible use allowing for modification as technology increases."

"The commonly available technologies for implementing local area networks used to be either traditional telephone technology, a low performance analogue connection or closed circuit television."

"The latter is a high performance throughput, analogue technology requiring additional cost to modify it for digital transmission and a technology where there is little experience in the field today," he said.

"Consequently Digital co-operated with Intel and Xerox to design a solution to meet the need in this high-speed digital communication area. Ethernet, a digital form of communication optimised for extremely fast transmission is that solution."

"A new technology for building local area networks, Ethernet provides a local networking path that is much higher in bandwidth and lower in error rate than past technologies."

BRIEFS

SATELLITE EQUIPMENT CONTRACT--CANBERRA--The Federal Government has approved a \$30 million proposed contract for the supply of satellite equipment. The Communications Minister, Mr Neil Brown, said negotiations between Aussat Pty Ltd and Mitsubishi Australia Ltd for eight major city earth stations had reached the final stage. "This is another important step towards meeting the Government's goal of having the national communications satellite system operating in 1985," Mr Brown said. Aussat, which is the owner and manager of the satellite system, is looking for sites in Sydney, Melbourne, Darwin, Perth, Adelaide, Canberra, Brisbane and Hobart for the earth stations. The total cost of the stations is about \$65 million, but the contract with Mitsubishi will be worth \$30 million. Mr Brown said half of the building work would be done by Australian contractors. He said the stations, which enable signals to be transmitted via the satellite, would be used by the Australian Broadcasting Commission for radio and television. [Brisbane THE COURIER-MAIL in English 20 Sep 82 p 9]

SATELLITE TV PLANS--THE Federal Government is to consider direct broadcasting by television networks when the domestic satellite is launched in 1985. But the move is vigorously opposed by regional television operators who fear direct broadcasting will kill them. The Minister for Communications, Mr Brown, has called for proposals from regional television stations. He told the Government joint parties there was potential in the satellite for direct broadcasting. The potential was largely unforeseen when the Government let tenders for the satellite. But since then the manufacturers had developed a switching system to make direct broadcasting possible. But the regional operators fear they could be swamped by network television programs produced in Sydney or Melbourne then beamed live throughout the country. A spokesman for Mr Brown yesterday agreed the television industry was operated largely on a regional basis. It is understood Mr Brown is considering the satellite's direct broadcasting potential in light of its new versatility. But the spokesman insisted no decision had been taken on how the new potential of the satellite should be used. [Canberra THE AUSTRALIAN in English 23 Sep 82 p 4]

CSO: 5500/7508

PEOPLE'S REPUBLIC OF CHINA

SHANGHAI SATELLITE TELECOMMUNICATIONS STATION DESCRIBED

OW200042 Shanghai JIEFANG RIBAO in Chinese 15 Oct 82 p 1

[Text] According to recent statistics of the International Telecommunications Satellite Organization: In first half of 1982, the telecommunications quality of the Shanghai satellite telecommunications ground station again ranked first together with another station among 227 international satellite telecommunications ground stations in the world.

The International Telecommunications Satellite Organization usually conducts a qualitative evaluation of the ground station in various countries every 6 months. The evaluating covers four major systems--antenna, high-power transmission [gao gong fang 7559 0501 2397], (?cold transmission) [leng can fang 0397 0639 2397], and electric power--; and three indices--equipment utilization ratio, number of traffic interruptions and total time of traffic interruptions. This is the fourth time that the Shanghai station rendered outstanding performance. Its open circuit ratio ranked first among 227 ground stations in the world.

The Shanghai ground station is one of China's major international communications facilities. It transmits and receives international telegrams, telephones, television and radio facsimile through a telecommunications satellite over the Pacific. When it was set up in 1972, it had only four lines leading to the United States. In the past 10 years, particularly since the 3d Plenary Session of the 11th CPC Central Committee, it has added 76 lines connecting with Japan, Australia, Singapore, Thailand and Hong Kong to meet the development of China's relations with foreign countries. Since 1978, the telecommunications handled by the station has been increasing at an average rate of 67 percent yearly. The party branch of the station has led the scientific and technical personnel and workers to seriously implement the guidelines of the 3d Plenary Session of the 11th CPC Central Committee, carry out education in patriotism to urge the workers and staff to win honor for the country, strengthen technical training and operational evaluation and exercise strict quality control. It has set up rules and regulations regarding "management of radio equipment," "operations of key equipment" and "analysis of electrical circuit equipment." At the same time, it has boldly emancipated the minds, undertaken 21 technical innovations on imported equipment and thus remarkably improved the quality of telecommunications.

CS0: 5500/4103

BRIEFS

BEIJING TELEPHONE SERVICE--Beijing, 9 Oct (XINHUA)--Beijing plans to increase the number of subscriber lines in the urban area from 115,000 at present to 200,000 in 1985, raising the average number of telephones per 100 persons from present 5 to 7 in 1985, according to the city's telecommunications bureau today. In order to attain the goal, 18 exchange offices are to be built or expanded by the end of 1985, of which three should be completed this year. The city now has 27 exchange offices in the urban area, with a total of 227,000 telephones. The state allocates special funds and remits all telephone profit. In addition, special permission is granted for telephone installation fees and joint investment with telephone subscribers. Dozens of engineers and technicians are working on the project and priority has been given to construction (?of) the telephone service. Most telephone subscribers are government offices and industrial and business establishments, neighbourhood and public telephones are used by the general public. Beijing began using a magnet type telephone system in May, 1904, when 110 telephones were installed in the summer palace, the imperial court and military installations of the Qing Dynasty. An automatic telephone system was set up in 1940 and there were only about 26,000 telephones in Beijing by October 1949, when the People's Republic was founded. [Text] [OW090831 Beijing XINHUA in English 0705 GMT 9 Oct 82]

LIAONING DIALING CAPACITY--Since the 3d Plenary Session of the 11th Party Central Committee, posts and telecommunications undertakings have been developed well in Liaoning Province. The number of telephones in the province's urban areas has increased by 35,000 sets, increasing at an average rate of 8 percent every year. The province now has 1,502 long-distance dialing lines, an increase of 54.33 percent over 1978. In the past 4 years, the province has built, one after another, the Shenyang long-distance communications general station, the Dandong international post and telecommunications exchange station, and the Qinhuangdao-Shenyang electric cable carrier equipment. As a result, the communications capacity has been increased and the shortage in this regard has been alleviated. In addition, long-distance automatic dialing exchange equipment has been basically built at the Shenyang long-distance communications general station. With the operation of this equipment in the first quarter of 1983, direct dialing services linking Shenyang with Anshan, Tieling, Liaoyang, Dandong, Jinzhou and Fuxin municipalities and linking Shenyang with Beijing, Tianjin, Shanghai, Lanzhou, Xian and Changchun municipalities will be established. [Shenyang Liaoning Provincial Service in Mandarin 1100 GMT 15 Oct 82 SK]

RADIO STATIONS MEETING--The broadcasting stations of seven eastern Chinese provinces and municipalities opened their second meeting to exchange information on news programs on 21 October in Wuxi City. The main topic of the meeting is to implement the guidelines of the 12th party congress, strive to produce good radio news programs and give better service for building the two civilizations. Attending the meeting are responsible persons of broadcasting administrations and broadcasting stations of the seven eastern Chinese provinces and municipalities, responsible persons of some city and county broadcasting stations and editors and reporters concerned. The Ministry of Radio and Television, the Central People's Broadcasting Station and radio stations of fraternal provinces, municipalities and autonomous regions also sent representatives to the meeting. (Li Wei), deputy director of the propaganda department of the Jiangsu Provincial CPC Committee, extended cordial greetings to the delegates at the meeting on behalf of the provincial party committee. Seventy delegates have begun discussions in a serious and lively atmosphere. [Text] [OW242100 Nanjing Jiangsu Provincial Service in Mandarin 2300 GMT 21 Oct 82]

CSO: 5500/4103

CABINET APPROVES TELECOMMUNICATIONS DEVELOPMENT PROGRAM

Manila BULLETIN TODAY in English 27 Oct 82 p 1

[Article by Willie Ng]

[Excerpt]

Prime Minister Cesar Virata and the First Lady, Minister of Human Settlements Imelda R. Marcos, led the cabinet last night in approving a P1-billion telecommunications development program for the nation's cities.

Mrs. Marcos said that government must get into the program because the private sector can not come up with the huge investment outlays required.

Noting that the Philippine Long Distance Telephone Co. and other telephone franchise holders can not handle the demand for communication facilities, she said:

"We have to get into the picture because private business can not afford the investment risks and the high interest on loans."

Minister of Transportation and Communications Jose Dans said that the program will be financed partly by a West German

loan, payable in 50 years, with a grace period of 20 years.

In the meeting held at the Batasang Pambansa, Minister Dans noted that telephone services have progressed at a snail's pace in the last 20 years. The telephone density was only 1.45 telephones per 100 persons as of Dec. 1, 1980, he said.

These figures are low compared to those in other developing countries, he said, citing Malaysia with a density of 3.82 telephones per 100 persons.

Improvement of phone facilities will begin in profitable commercial or urban areas such as Metro Manila, Cebu, and Davao, Dans said.

The cabinet also approved a plan to improve telecommunications facilities in Regions 1 and 2 in Northern Luzon, providing an additional 32,000 main stations and 49 local exchanges with 37 toll stations, known as Phase II.

HONDURAS

BRIEFS

MORE TELEPHONE LINES--Tegucigalpa--The Honduras Telecommunications Company is continuing to improve and enlarge the capital's telephone system by installing 11,000 telephone lines which will benefit an equal number of Central District families. At present an adjudication commission of representatives of HONDUTEL, Support Agency of the Republic, and the Office of Administrative Integrity is studying the qualifying bids presented by 29 firms specializing in building and supplying materials for connecting modern telephone systems. The Miraflores and Toncontin telephone plant enlargement project will make possible the operation of an additional 6,000 lines in Comayaguela and 5,000 lines in the Tegucigalpa sector beginning in November 1983. If there are no complications, in the coming months bids will be taken for the purchase of equipment and materials while the infrastructure work will begin which will make it possible, according to plan, to begin the actual work next January. [Text] [San Pedro Sula LA PRENSA in Spanish 15 Sep 82 p 4] 9204

CSO: 5500/2005

NICARAGUA

BRIEFS

OCOTAL-JALAPA TELEPHONE LINE--Jalapa--With the dialing of the prefix 02 and the telephone number of the Office of the Minister of Telecommunications and Postal Service of Nicaragua the important hard line Ocotal-Jalapa was put into operation on the 17th of this month. Companero Marne Serrano, vice minister for technical development for TELCOR [Nicaraguan Telecommunications and Postal Services Institute], said "Hello, hello" over the telephone to Minister Enrique Schmidt. This TELCOR project, which involves a development from every point of view, cost 2.5 million cordobas. Part of the equipment, donated by the Mexican Government, required an investment of 1 million cordobas. The hard line Ocotal-Jalapa project was begun last January with 30 TELCOR comrades participating. They worked night and day under the supervision of specialized technicians to provide the Nueva Segovia Municipality with an efficient automatic telephone service. This work is the last phase of the project which also includes Esteli, Somoto, Las Manos and El Espino and which is 75 kilometers long. The work began in 1981. [By Jilma Rodriguez] [Excerpts] [Managua BARRICADA in Spanish 21 Sep 82 p 7] 9204

RADIO ZINICA DESCRIBED--Bluefields--Radio Zinica, a station of CORADEP, the Radio Broadcasting Corporation of the People, broadcasts on two frequencies. Thus it and La Voz de Nicaragua are the only broadcasters with short and medium wave transmitters. Radio Zinica started broadcasting in this part of the Atlantic Coast on 11 October 1979. Since then, it has shown itself to be a radio station with a new outlook since it has assumed an educational, guiding and formative role on the Atlantic Coast. With the installation of the new transmitter--the result of the efforts of La Voz de Nicaragua and INNICA [Nicaraguan Institute of the Atlantic Coast] the station plans to expand its operations, carrying the revolutionary message to a wider area. Specifically, the Radio Zinica broadcasts on two frequencies constitute another achievement of the revolution as a means of integrating this area more and more with the rest of the country. During the almost 3 years since it was created, the revolutionary transmitter has reached a high level of development in both the technical and the economic aspects. Since it became part of CORADEP, it has been provided better support and advice necessary for the proper operation of the transmitter. With varied programs, Radio Zinica goes on the air from 0500 hours to 2300 hours. The station's message reaches several cities inside the country and abroad, according to reports which have been received. Because of its revolutionary line it is also the voice of the coastal people. [By Teofilo Barrillas] [Excerpts] [Managua BARRICADA in Spanish 20 Sep 82 p 7] 9204

CSO: 5500/2005

ST. LUCIA

BRIEFS

INTERNATIONAL PHONE DIALING--THE Castries, Sans Souci and Reduit telephone exchanges will be "cut over" to the International Subscriber Dialling (ISD) system on September 25 at around 2 o'clock in the afternoon. Mr. Gynn said that cut over set for August 28, had to be postponed due to engineering hold ups. "We had not finished testing the system. It is a very complex system and we want to ensure that everything is in order before we put it into use. So we are carrying out numerous tests on all lines and customers' equipment," he explained. Meanwhile, the company requests that on the time of cut over, subscribers refrain from using their telephones. The General Manager said that any call during that time may be disconnected and subscribers should 'avoid making any calls between 1.45 p.m. and 2.15 p.m." He added: "Due to the size and complexity of this change, only a restricted service will be available throughout the rest of the afternoon." After cut over, a test call will be made to all tepehones, the public is requested to confirm this test with the Operator that subscribers have the correct number which corresponds with the number listed in the telephone directory, said Mr. Gynn. [Castries THE WEEK-END VOICE in English 11 Sep 82 p 3]

CSO: 5500/7507

TELECOMMUNICATIONS PROJECTS REVIEWED

Amman AL-RA'Y in Arabic 23 Aug 82 p 8

[Text] The era we now live in is an era of communications. The telephone has become the chief requirement and the foundation in the world of communications for any advanced society.

Simply speaking, the telephone represents the shortening of time and distances, the elimination of obstacles, and the bypassing of difficulties. Many actions can be accomplished by means of it. Through this device, disasters and tragedies can be avoided. Because of these characteristics, the telephone is a main focus of concern on the part of the government, which is endeavoring by a variety of means to move Jordan into the ranks of the developed world. What is the telephone's position on the map of progress? How do officials respond to the complaints and inquiries of citizens regarding telephone problems? What is the future of telecommunications in Jordan in the coming year?

Engineer Muhammad Shahid Isma'il, general director of the Wire and Wireless Communications Organization, answers these and other questions in this interview with the JORDANIAN NEWS AGENCY.

The Shortage

Concerning the plan that has been formulated to provide additional telephone lines to fill the existing shortage and meet the request of any citizen who wishes to subscribe without delay, the general director of the Wire and Wireless Communications Organization had the following to say:

"In accordance with the projects of the 1981-1985 five-year development plan, the total number of telephones available in the kingdom will reach 248,000, including 200,000 telephones in the capital itself. The organization will spend some 1,107,000 dinars in capital expenditures for this purpose. This represents four times the amount allocated to the organization in the previous five-year plan. This reflects the concern and commitment of the state to expanding the volume of telephone services in sufficient amount to meet the growing demand.

"In this context, 117,465 telephone lines will be provided in accordance with projects funded through the Jordanian-French Financial Protocol. Contracts were let for these projects early last year and they are currently under completion. An additional 19,000 telephone lines will be provided through a project aimed at increasing the capacities of the electronic exchanges in operation in the capital. The contract for this project was let last May. Some 30,000 additional lines will be installed in the central capital through another project for which the contract was awarded last June. In addition, 50,000 telephone lines will be added in the city of al'Aqabah. The contract for this project was also awarded last June.

"All of these are in addition to the other projects that will provide additional telephone lines."

Direct National Dialing

Engineer Isma'il also commented on the situation regarding direct automatic dialing service among cities within the kingdom and between the kingdom and the rest of the world and discussed the question of when all the areas of the kingdom would be connected with each other and with the outside world through direct automatic dialing. He said the following on this subject:

"There is one exchange for direct automatic dialing at the national level and another for direct automatic dialing at the international level.

"Work is currently underway on a project concerning a new electronic exchange for direct automatic dialing at the national level between the capital and other cities in the kingdom. It is hoped that this exchange will be put in service before the end of the current year.

Automatic Direct Dialing

"With regard to direct automatic dialing at the international level, the installation of this exchange has also fallen behind schedule due to unalterable circumstances. However, the memorandum of mutual agreement between the Jordanian and French governments stipulates that this exchange shall be put into service in stages beginning in November. Moreover, installation of parts of the main exchange began last July. After this exchange is put into operation, Jordan will be connected through direct automatic dialing with various other countries of the world."

Radio Telephones

Concerning the subject of vehicle telephones and their importance and justifications, Engineer Isma'il said: "We are currently in the final stages of letting the contract for this project through which the organization will provide this modern level of service to businessmen, top officials, doctors, contractors, and others in the greater Amman area following the lead of other Arab capitals. It is apparent to anyone that the provision of such services is, in itself, one means of attracting Arab and foreign capital to the kingdom.

"In addition, huge amounts of money are currently being spent to ensure private radio communications for companies, especially in work areas that do not presently have telephone service. Through this project, radio communications can be provided for these sites. This will be accomplished through fixed radio-telephone equipment installed at the work site that will allow the employer to request any domestic or foreign number through purely automatic means. It will also allow employers to install mobile radio-telephone equipment in vehicles if they wish to do so.

"Therefore, the project is not limited to vehicles because radio-telephones can be either fixed or mobile.

Radiotelephones

"From all this, it is clear that the radiotelephone project in this sense is an integrated part of the overall national plan for telephones operating over regular wire networks and is not some kind of luxury. The radiotelephone subscriber can take advantage of all the facilities of the Jordanian national network whether the radiotelephone set is installed in his vehicle, at his plant, or in his office. On the other hand, the services of private radio communications are restricted to limited direct communications between the headquarters of the company and its employees.

"In the planning, care was taken to ensure that the project would be compatible with the latest electronic systems through interlocking modules. This will allow easy expansion of the geographical area served by the project in the future."

Concerning the volume of daily telephone calls within Jordan and between Jordan and the rest of the world, the general director of the communications organization explained: "The volume of international traffic in 1981 amounted to 4,736,297 minutes to various international termination points. This included 2,799,003 minutes with Arab countries. The total volume of this traffic in 1973 was 1,076,369 minutes. This shows the rate of increase in telephone calls in Jordan."

Errors in Bills

With regard to reasons for errors in the amounts due on citizens' telephone bills and ways of correcting them, Engineer Isma'il said:

"Through the use of automatic direct international and national dialing, a special computer will automatically and instantly record the details of each call on a special magnetic tape. It will record the number of the caller, the number called, the date of the call, and the length of the call. This will tend to simplify the process of punching the cards and thus improve the speed of preparation and accuracy of the bills. This is because the punching and checking process requires time and effort, as is indicated by the fact that an average of 140,000 cards are punched per month. These are sent to the Royal Scientific Society to be checked by computer.

"In spite of the present situation, the rate of errors in the amounts of bills is no more than 0.2 percent."

8591

CSO: 5500/4737

INTER-AFRICAN AFFAIRS

REPORT ON 'PANA' MEETING IN SENEGAL

AB310917 Paris AFP in French 1504 GMT 30 Oct 82

[Text] Dakar, 30 Oct (AFP)--The Pan-African News Agency (PANA), which is expected to become operational early next year, has taken an important step in that direction by choosing the technical equipment for its headquarters in Dakar and its regional pool centers in Lagos, Khartoum, Lusaka, Kinshasa and Tripoli.

The equipment was chosen at the end of a meeting in Dakar of PANA's technical committee, which also confirmed the configuration of the agency's telecommunication network. According to PANA director Cheikh Ousmane Diallo, this network will be composed of permanent one-way and two-way circuits for the transmission and reception of news between the headquarters and each pool center and of radio links for the transmission of news from the pool centers to each member state of the pool.

According to PANA, each African news agency will utilize its own means to transmit its news to the regional pool centers or to PANA headquarters.

Mr Diallo indicated that the orders for the equipment and one-way links will be placed "as soon as possible."

The technical committee also decided to begin the training of PANA's technical staff and of the technical staff of member states that do not have a national agency.

In addition, the coordinating committee on the integrated program for the development of news agencies in Africa began to meet in Dakar Saturday with a view to harmonizing the aid received at multilateral level for the development of African agencies.

This program, which receives international financial aid amounting to about \$5 million, will help to supply PANA with experts, consultants and equipment as well as train its staff.

At the opening session, Gerard Bolla, UNESCO deputy director for communication, said that PANA's success is necessary for Africa and UNESCO "not only for the sake of satisfaction over a well-accomplished task but also to silence those who still doubt our ability to gradually eliminate the current imbalances and injustices in the field of communication."

Senegalese Minister of Information Djibo Ka stressed that the wager over PANA is finally being won thanks to the political will of the African states and international cooperation. He also hailed the support given to PANA by UNESCO, Arab and European countries (FRG and France), and international organizations.

CSO: 5500/23

ZAIRE

BRIEFS

PHONE LINK TO FRANCE--French subscribers can now telephone direct to Zaire, it was announced recently in Paris. The code is (19)243. The cost is 55 centimes per 1.9 seconds. Zaire is the 110th country to have its telephones automatically linked to France. [Text] [London WEST AFRICA in English No 3401, 11 Oct 82 p 2682]

CSO: 5500/16

MINISTER SAYS NEW MASS MEDIA COMPLEX WILL NOT IMPROVE RECEPTION

Lusaka TIMES OF ZAMBIA in English 20 Oct 82 p 1

[Excerpt]

THE new mass media complex will not improve radio reception until new transmitters are bought, Minister of Information and Broadcasting Mr Mark Tambatamba said yesterday.

Mr Tambatamba said this during the official opening ceremony by President Kaunda.

He also said delays to start construction work on the multi-million Kwacha complex led to the escalation of the cost from the estimated K20 million to K44 million.

He told the nation not to be over optimistic about improvement in radio reception after the complex had been commissioned. Such improvement could be evident if funds were made available to buy new transmitters.

He told the guests, including

Party Secretary-General Mulemba, Prime Minister Mundia, Secretary of State for Defence and Security Zulu and other top officials, that work started behind schedule in 1979 instead of November 1978.

Started

"The construction of the complex started in 1979. At the time it was estimated that the complex would have cost K19 to K20 million. With escalating costs due to world-wide inflationary trends the complex has cost Zambia K44 million."

Mr Tambatamba said many problems had been met during the construction of the complex and there were "bottlenecks" which contributed to the delay in completing the work.

He commended the Nisho-Iwai company for having endured the problems that were faced during construction work.

CSO: 5500/22

FEDERAL REPUBLIC OF GERMANY

BRIEFS

SATELLITE TEXT, IMAGES--It is no longer utopian to transmit text or graphic illustrations via satellite and to have them printed out within a few seconds anywhere in the world. The ESA is showing what can today be done with electronic image scanning and electronic printing processes at the 9-21 August Unispace Conference in Vienna. Ground stations for telecommunications were established especially for this demonstration by ESA in Noordwijk (The Netherlands) and in Vienna. Developments by Agfa-Gevaert are being used as transmitters and receivers. They consist of an image scanner and an electronic printer. Data and the printing order are put in via the image scanner at the Noordwijk ground station. From there, the signal is routed via the OTS, a forerunner of the ESC to the ground station in Vienna where the printer immediately makes the data put in visible. Both the image scanner and the printer process a DIN [German Industrial Standard] A4 form within 4 seconds. Here, digital image processing of the scanner guarantees an image quality (resolution capacity) which shows 8 points per millimeter horizontally and 7.7 points per millimeter vertically. Electronic screening produces shades of grey. [Text] [Duesseldorf VDI NACHRICHTEN in German 13 Aug 82 p 24] 5058

CSO: 5500/2519

PUBLIC SECTOR'S NUMBER OF, BUDGET ALLOTMENT FOR COMPUTERS

Paris LES ECHOS in French 22 Sep 82 pp 11-13

[Article by Pierre Linde]

[Excerpts] Nine thousand thirty four computers with a total value estimated at 19.75 billion francs; that is the current colossal size of the data processing inventory held by public administrations and enterprises. These bodies have multiplied their data processing consumption seven-fold in 10 years, and now hold more than one-third of the national inventory of computers in service. But this data processing gluttony is not without many gaps and shortcomings in acquisition and management, while more and more people fear that this electronic superpower will threaten their individual liberties.

The public sector has been forced to make the computer its instrument of choice, whether for managing, controlling, or distributing a right (for transportation, for payment), or even for collecting its due.

At times this instrument has also served to disseminate among the public an unpopular or distorted picture of data processing: it's the electric bill that asks for two cents, threatening immediate sanctions; it's the fine which you have to pay once more because the computer does not seem to have recorded the first payment; it's the reserved seat on the train which does not exist; and it's a false indicator from INSEE (National Institute for Statistics and Economic Studies).

17 Percent per Year Growth

Minor errors to be sure. But each of them a source of irritation for the population, which soon ends up forgetting the extensive services that it now receives from data processing in its daily life. Services that are sometimes known to a few initiates for whom the "electronic good fairy" is an essential partner; these people are researchers, military men, meteorologists, flight controllers, as well as law professionals, parliament deputies, and policemen (through anti-terrorist files, for instance).

The consequence is a public sector that leads the consumption of data processing in France. The value of its computer inventory is growing at an average annual rate of 17 percent, against only 13 percent for the private sector. Moreover, its operating and management expenses should exceed 15 billion francs during this year.

Distribution of administration inventory by number and value of computers installed each year.

Répartition du parc des administrations par nombre et en valeur d'ordinateurs installés chaque année				
(A) Année d'installation	(B) Total		(E) Croissance (%)	
	(C) Nombre	(D) Valeur en KF	Nombre	Valeur
1963-1965	0	0	0	0
1966	7	41.001	0	0
1967	20	66.964	1	1
1968	8	10.761	0	0
1969	24	57.492	1	1
1970	47	133.229	1	1
1971	63	323.403	1	3
1972	119	170.811	3	2
1973	237	867.767	6	9
1974	311	656.306	7	7
1975	331	840.662	8	8
1976	358	636.174	8	6
1977	538	1.005.727	13	10
1978	657	1.553.348	16	16
1979	737	1.930.827	17	20
1980	767	1.545.792	18	16
Total	4.224	9.840.364	100	100

Distribution of public enterprise inventory by year of installation.

Répartition du parc des entreprises publiques par année d'installation				
(A) Année d'installation	(B) Total		(E) Croissance (%)	
	(C) Nombre	(D) Valeur en KF	Nombre	Valeur
1963	8	9.224	0	0
1964	1	3.500	0	0
1965	1	300	0	0
1966	8	41.152	0	0
1967	14	100.034	0	1
1968	15	53.884	1	1
1969	52	71.351	1	1
1970	42	94.094	1	1
1971	65	45.431	1	0
1972	165	160.690	4	2
1973	248	410.825	5	4
1974	304	830.443	6	8
1975	308	698.808	6	7
1976	515	810.344	11	8
1977	562	1.246.004	12	12
1978	666	1.334.538	14	14
1979	860	2.254.923	18	23
1980	976	1.804.002	20	18
Total	4.810	9.969.547	100	100

Key: (A) Year of installation
 (B) Total
 (C) Number
 (D) Value in KF
 (E) Growth (percent)

Not only are public enterprises and administrations the largest consumers of data processing in France. but they also have the largest systems, applications, and programmer staffs.

One emerging problem is the human cost, which is essentially equal to that of equipment acquisition and rental. Data processing personnel (35,748 people in 1981) is increasing at 3.3 percent per year. According to a Sagha Marketing study, personnel represents 40 percent of the data processing budget of the administrations, compared to only 31 percent for public enterprises. The former apparently are endowed with lower performance equipment, or are less concerned with productivity and good management than the latter.

PTT in the Lead

The data processing vitality of public enterprises (French National Railroad, Electricite de France, and so on) is confirmed by their equipment expenses, which are increasing more rapidly than those of the administrations (see tables extracted from the last annual survey published at the beginning of 1982 by the Ministry of Industry).

The important role played by the Paris region for both sectors is particularly evident in the geographic distribution of their computer inventories, since 56.9 percent and 36 percent of their value, respectively, is concentrated in that region. Once more, this demonstrates the small effect of the decentralization policy conducted by the government for the past 20 years.

PTT is the largest data processing consumer among the administrations. On 1 January 1981, it was using 941 computers of all sizes, with a total value of 2.32 billion francs.

In decreasing order, PTT is followed by the Ministry of Health and Social Security (706 computers with a unit value of more than 0.25 million francs), Interior (662 computers, of which 556 for local collectivities), Defense (535), Universities (458), Economy and Budget (426), Agriculture (206), Education (164), Environment (101), Transportation (94), Industry (53), Labor (31), Justice (20), Culture (9), the Prime Minister (8), and Foreign Affairs (7). It is difficult to assess the ratio of equipment to the tasks that must be performed by these departments, especially since the equipment being used does not have equal performances.

However, surprising disproportions do arise. For instance, Foreign Trade has only one medium size computer, while Environment has more than one hundred. Very strange....

Benefits of "Frenchification"

On the other hand, the "Frenchification" policy carried out by the government has been of great benefit to French equipment manufacturers, whose deliveries between 1979 and 1980 have increased by 5.5 percent for the administrations, and by 4.4 percent for public enterprises (see tables). In value, the former's equipment is 63.1 percent of national origin, and 42.5 percent of that comes from CII Honeywell-Bull alone.

Distribution of value of equipment (unit value less than 60 KF, including all taxes), in public enterprises, by manufacturer.

Répartition par constructeur dans les entreprises publiques de la valeur des équipements (valeur unitaire inférieure à 60 KF TTC)				
(A) Part constructeurs (%)		1980	1979	Evolution (B)
FRANCE	CII-HB	16,5	15,5	+ 1
	Sema	6,1	6,3	- 0,2
	Alcatel	5,2	3,6	+ 1,6
	Logabax	3,2	2,2	+ 1
	Interchnique	1,5		
	Divers	2,9	3,4	+ 1
	Total	35,4	31	+ 4,4
EUROPEENS	Nixdorf	1,2		
	Olivetti	1,1		
	Divers	1,2		
	Total (hors France) . (C)	3,5	2,8	+ 0,7

Distribution of value of equipment (unit value less than 60 KF, including all taxes), in administrations, by manufacturer.

Répartition dans l'administration par constructeur de la valeur des équipements (valeur unitaire inférieure à 60 KF TTC)				
(A) Part constructeurs (%)		1980	1979	Evolution (B)
FRANÇAIS	CII-HB	42,5	41,8	+ 0,7
	Sema	7,3	7,1	+ 0,2
	Sagem	3	2,4	+ 0,6
	Alcatel	3,2	1,9	+ 1,3
	Sfena	1,7	1,1	+ 0,6
	Logabax	1,2	3,7	+ 1,7
	Divers	4,2		
	Total	63,1	58	+ 5,1
EUROPEENS	Total (hors France) . (C) ..	2,3	1,8	+ 0,5

Key: (A) Manufacturers' share (percent)
 (B) Change
 (C) Hors France = abroad

Except for the European suppliers, which are experiencing a slight growth in this market (+0.15 percent), the major losers have been the American companies, and in particular IBM (-3.9 percent, with the world leader controlling no more than 19.4 percent of this inventory at this point), Control Data (-2.1 percent), and Burroughs (-0.3 percent).

Overall, they are also losing ground with the public enterprises, where they now control only 61.1 percent of the inventory value, compared to 66.2 percent in 1979. The most affected groups are IBM, Control Data, and Univac. But there are two exceptions, Hewlett-Packard and Digital Equipment (DEC), which between 1979 and 1980 have seen their sales increase by 0.2 and 0.1 percent, respectively,

In the French manufacturer camp, only SMS has registered a loss (0.2 percent). CII Honeywell-Bull still holds the lion's share by controlling 16.5 percent of the inventory value, compared to 15.5 percent in 1979. Although the French leader is still improving its position on this market, it is still very far from IBM, which controls 38.8 percent of it.

These comprehensive statistics also hide large disparities. In some administrations and public enterprises for instance, the foreign manufacturers are consolidating their position, and even strengthening it. Such is the case of IBM, benefiting from the leverage derived from its large basis of installed equipment.

The government's interest in encouraging national production has not always been beneficial. In particular, experts at the Audit Office have on several occasions objected to this policy of "preferential purchases," which at times has led to costly substitutions of equipment (notably at the National Center for Space Studies, or the Toulouse Regional Hospital Center). In those cases, the selection recommended by the government was implemented with new equipment which was incompatible with existing systems.

Gaps and Shortcomings

In turn, the procedure that requires consultation with organs responsible for promoting the state industrial policy in administrations, can be the cause for long delays in the execution of projects; for instance, the hydrographic and oceanographic department of the Navy had to wait more than two and one-half years for the decision of the ministerial commission in order to receive approval to replace a computer. The delays are at times caused by changes in the manufacturer's marketing orientations after the equipment is delivered.

This was the case of the MITRA 125 installed at the University of Angers in 1978, which had to be adapted for new applications, but which was no longer being marketed by the manufacturer the following year.

"A better control of data processing must be planned for the public sector," is what the Audit Office recommended last year, pointing out "gaps and shortcomings" in this area. In many cases, a definite lack of rationality compounds the absence or weakness of planning in data processing.

And while some offices of the Social Security or the Banque de France have sought to reconcile centralization and decentralization as a function of types of processing, this balance is far from having been achieved everywhere. For instance: "The systems installed at the Academy of Dijon or at the National Center for Hospital Studies, which are excessively centralized, did not sufficiently take into account the real needs of the universities which they serviced. In other cases on the other hand (Center for Technical Studies on Equipment, Department of Technical Studies for Roads and Freeways), the insufficient control of operations creates a dispersion of study groups, and even job duplication."

In the administrations, cost control is often hindered by the failure to take into account equipment depreciation, as well as by the difficulty in isolating total operation costs in budgets and accounts. In principle, at the time of computerization, "units for organization and methods" should be assigned the task of formulating specifications and of supervising the implementation of applications in data processing centers.

"There should always be a project leader responsible to the administrative authority which is a direct beneficiary. These principles seem to have been overlooked, at least until recently, by the regional data processing centers that concern themselves with family allocations and with collections, as well as by the Compagnie Generale Maritime."

Recourse to outside consulting companies or subcontractors has at times had the effect of diluting responsibilities, and has "given rise to serious mistakes: delays in perfecting programs, unusable documentation, serious accounting errors, and accounts that could not be justified."

"On the other hand, in use, the equipment selected often proves to be overspecified for real needs." The resulting excessive capabilities entail excessive costs and the use of applications that are not strictly necessary, in order to absorb the surplus computation capabilities. "In short, an expensive fling...."

Another observation is that the benefits to be expected from public data processing are not always perceived at their true value, notably by the data processing personnel of administrations or nationalized enterprises, who sometimes have the impression that some technologic changes occur to the detriment of their established privileges, and that these changes will lead to disqualifications or additional work.

Schism Between the Population and the Machine

This has led to recurrent strikes (particularly in the data processing centers of Social Security and nationalized banks) whose ultimate victims are the users. The latter are left with the feeling that they receive poorer service since the massive introduction of these computers, which make gross errors in their accounts (but relatively few and small) and break down unexpectedly.

The formula often heard at service windows, "I can't help it, it's the computer," has finally turned against the clerks (henceforth deemed incapable of any initiative) and against public data processing, which is blamed for everything. This schism between the public and the electronic machine is harmful to the administration's credibility.

One last and serious problem is the protection of individual liberties. Indeed, the public sector is forced by the nature of things to computerize its vast files, which contain all the information about the lives of private individuals, from their birth to their death.

A political or indiscreet use of some of the information (social origin, party allegiance, color of skin, religion, and so on) could harm the people involved.

This potential threat has caused the National Commission on Data Processing and Liberty (CNIL), chaired by Senator Jacques Thirault, to closely examine the problem raised by the utilization of these files, and to issue a number of opinions and recommendations. Such has been the case of the anti-terrorist file currently implemented by the Ministry of the Interior.

Since 1978, "the automatic processing of identification information carried out on behalf of the government...is regulated by a law or by a regulatory act created after a founded opinion from CNIL. If the commission's opinion is favorable, it can be overruled only by a decree issued on the basis of a consonant opinion of the Council of State...."

Thus the public is apparently well protected, but no law can prevent the waste, incompetence, and lax data processing of certain administrations, which are subject to the constraints of a budget, but unfortunately not to those of optimum efficiency.

11,023

CSO: 5500/2506

FRANCE

ENTREPRENEURS CREATE DATA PROCESSING FIRMS, INNOVATIONS

Paris L'USINE NOUVELLE in French 16 Sep 82 pp 118-127

[Article by Albert Galland: "The Daredevils of Data Processing"]

[Excerpts] Six years old, with a lot of energy: the young kids in French data processing companies aren't afraid of competing with the foreign multinationals in the areas of CAO [Computer-Aided Design], voice recognition, automation, etc. Imaginative, dynamic, hardworking, these little companies have made a number of breakthroughs into a market which they have greatly helped to reinvigorate.

If we had to bring together in the SICOB [International Exhibition of Data Processing, Communications, and Office Management] all the new French data processing companies, one section, even a large one, wouldn't be big enough! For in France, we are now seeing the same phenomenon as in the United States: the number of these new companies is growing. And these companies, which thrive on innovation, are a major advantage for the French computer industry. Two more reasons tend to suggest that the future doesn't seem too bleak for French data processing. First of all, France has a strong telecommunications industry. And secondly, the government obviously intends to develop this sector.

These bright young men in data processing, whom we are going to introduce in this article, who have accepted the challenge of developing new products and facing prestigious foreign competitors, all established their company within the past 6 years (this was a criterion set by L'USINE NOUVELLE for this report). Rather relaxed in appearance--the trademark of a generation at home on a university campus--nothing at first glance would tend to set them apart from other researchers. Much more at ease in front of a computer console than behind a desk, they seem surprised that we would want to photograph them. Is that false modesty? Not really. Like all leaders who have just established their own business, what they are doing comes before

what they are. And when they start to talk about technological innovations, the words just pour out.

In terms of office decor, reality goes beyond fiction. In large, white-walled rooms, these directors of data processing companies manage their small staffs. They know that the size of their company is one of the determinants of their success, and a guarantee of their competitiveness, even though a good number of their clients would like to see them grow and increase the work they will take on. "There is no possibility of that," says Jacques Homo, the P-DG [President-Chairman of the Board] of CEFTI [French Remote Data Processing Company]. "Our staff will not get any larger than 20 people, the critical threshold for working together. Also, in a time of crisis, it is essential to control our expansion." This is a decisive opinion, but one that is shared by many of these people, who favor business on a human scale.

While government and university labs serve as a breeding ground for the creators of data processing firms, some companies also offer a favorable climate for people who want to move ahead. For example, when Georges Cottin in 1975 decided to create MBC Alcyane, he spoke to people at Hewlett-Packard, where he had worked for 4 years. They were not themselves interested in micro-processing, but they encouraged him and gave him lots of advice.

This attitude favors good working relationships later. Daniel Picard in 1979 was sales director for Computervision in southern Europe; this company is the world leader in CAO. At that time he did a market study for Electrobél on the establishment of a CAO and micrographics service company. Daniel Picard, who is now president of the SIG [Computer Graphics Company], says: "The Belgian company then asked Computervision for me. There wasn't anything secret about this; it was a frank and open discussion, in which we looked for solutions. So it wasn't exactly a job change."

This type of relationship is still relatively rare in Europe, even though for the past year or two there has been more understanding shown by large companies to people who leave them to set up their own firm. But it is often the difficulties a company is going through that cause the greatest offshoots. The case of CDV Electronic is illustrative.

This company grew out of a reorganization of Logabax. In May 1981 the first French manufacturer of minicomputers decided to close its plant in Toulouse (which handled 70 percent of its production). The staff then refused to accept the 120 layoffs.

They occupied the plant and prevented the transfer of its equipment to the Paris region. After doing a study of the French market and making contacts with potential clients, two Logabax engineers, Christian Viguerie and Christian Decool, decided to set up "their own shop." So now 80 percent of their work is subcontracted from the new Logabax company.

But wherever they come from and whatever their plans may be, these young innovators, rather than financial backing, had only the encouragement of the government and sometimes the moral support of the companies or research centers they were leaving. So they had to make their own way, a way off the beaten track.

In 1975 when Daniel de Pinho decided to establish Minotec at Labège, near Toulouse, he was looking for a job and all the money he had was 10,000 francs. But Daniel is a true builder at heart. He built everything himself, even down to the very walls of his company! "If you want to get started," he says, "it is better to have friends in industry. I didn't have any financial backing, but a good many companies in the region helped me out. One of them lent me office space, and another let me use their office staff." Today his company has 30 employees and its sales volume grew from 5.7 million francs in 1980 to 10 million in 1981.

Avoiding Going Faster than Resources Allow

Some of these new companies, 2 or 3 years after solving their initial financing problems, have to look for additional financing in order not to fall victims to their own growth. That has been a major problem for Jacques Homo, the head of the CEFTI. "As paradoxical as it may seem, now we have to slow down our expansion, for it sometimes goes faster than we would like, and faster than our resources allow us to go." In data processing even more than in other fields, rapid growth demands painstaking management. Especially in a case like Symag's, which grew from 2 million francs in 1980 with four employees to 30 million in 1982, with a payroll of 35! In such a case, an appeal to new financial partners is necessary. The 20,000 francs amassed by the founding associates in 1979 were no longer enough to handle such growth. As a consequence, the founders no longer hold a majority interest in the company, but their decisive role in the design of the products still lets them keep complete control of development.

The more successful these new companies are, the more interesting they look to the big names in computers and electronics. In many instances, this has been one of the prices paid for

innovation. While in the United States, the trend is to sell their newly created company for as much as they can get, in France most of these company founders fight to hold on to it. But not always! Behavior changes. That is a matter of generation, and also of realism.

So, a few months after the founding of the company in 1979, and after getting off to a promising start, Datavision lost two big contracts. That was a harsh blow; they needed to find money. "One morning in the summer of 1980, the phone rang. It was Matra calling. They had a software company at Velizy. This was great for us, because of their complementarity and the field for experimentation they could offer. The ANVAR [National Agency for the Valorization of Research], which then held 40 percent of the Euclid software, sold their stock back to Matra, which now holds 51 percent," explains Michel Theron, who is today president of Matra-Datavision.

While these PMI [Small and Medium Industries] in data processing do take risks, they don't go out of their way to find them. In terms of products, they tend to be rather cautious. Of course, they do innovate, but not systematically. In any event, in data processing, innovation most often means developing already existing products. So they are constantly collecting technological data both in France and abroad.

With this in mind, an annual trip to the United States, most often to California's Silicon Valley, has become essential for many people. They can never anticipate enough: "During my last trip to the United States 2 months ago, I became aware of some new technologies which will reach the French market in 2 years," says Christian Deccol of CDV Electronic. For the same reason, he also attends German and Japanese industry shows.

Developing existing systems to the utmost is a major concern of these PMI in data processing. The method is both simple and effective. It is a matter of placing products in high-impact markets, using networks to sell them, and developing exports.

Even though data processing is developing rapidly, some areas are having an even more spectacular expansion. This is true of microprocessing, services, automation, and maintenance. This listing also has a corollary: training requirements grow at an exponential rate.

Companies such as Symag, Axel, and Scribtel are in a good position to meet the developments in microprocessing and appropriate services (software). The more the market grows, the more they can expand.

Scribtel, which was founded in 1979, has had its sales increase from 1 to 5 million francs by 1982. The explanation for this growth lies in the fact that after first concentrating on subcontracting data processing jobs, in January 1981 the company decided to move into office automation systems. Today it has become one of the leading office automation specialists.

This concentration on various sectors of activity is quite impressive, but it does remain rational. On 1 January 1982 Alain Dessein established, in cooperation with a company in Nice, MIS, Micro-Expansion. The objective: to bring to microprocessing a powerful operating system, a hard disk with an incorporated safeguard, and the possibility of a multi-position operation. Alain Dessein wants nothing more and nothing less than to bring microprocessing to the level of efficiency and performances that has been reached by miniprocessors.

"We can say that our goal has been reached, since the Apple II with the M/DOS 65 02 interface, connected with a Galaxian 140 hard disk has brought this system to a level much higher than what is possible with a great many minicomputers, especially if we include the multi-position extension possibilities," says Alain Dessein, with both precision and pride. Dessein is a little disappointed, despite the success of this system, with 70 disks sold in 3 and a half months. The Lyon-based firm was aiming at the PME [Small and Medium Business] market. But 80 percent of these hard disks are being used in big companies. So, though the target was not hit, the company has had a commercial success.

Another favorite sector for these new companies is automation. "We are working on computer systems for continuous casting in metallurgy and on computer management systems for production in mechanical and electrical industries," says Claude Otrage, the head of Apsis, one of the leaders in computer engineering specializing in high availability systems.

Apsis is developing multiple systems (both hardware and software) designed so that a component failure is an expected occurrence. "In 1974 Telemecanique asked me to develop such systems using the Solar minicomputer. There are now over 100 models of these systems operational. These systems are not yet within the reach of all businesses, but we are confident that less expensive products will be available in the mid term, and we may be involved with their development," adds Claude Otrage.

Still in the field of automation, a Grenoble company with a staff of 25, Telematique, which was established in 1978, is working on the automation of manufacturing processes. Its engineers have already set up in industry automation systems ranging from very simple to highly sophisticated systems, using a digital computer. They have also designed and developed a control module for some motors.

Despite their imagination, the expansion of such companies is limited by the narrow bounds of the French market. "We have reached levels of the domestic market that can hardly be increased. So growth will depend on exports or on diversification. The market for computer simulation, for example, is one such area," says Michel Predon, the head of the Grenoble center of the CERC I [expansion unknown]. The mission of this Jeumont-Schneider subsidiary is to provide the supervision system for the Themis solar power plant.

Microprocessing and automation offer some real possibilities for expansion. And the fields of maintenance and training have even greater potential.

One of the essential characteristics of these PMI is that they are flexible. They know how to adapt and to take advantage of hidden resources. For example, working in collaboration with big companies and technical centers enables them to develop adapted products, to establish good commercial credentials, and to use the support of a well known image.

One of the first clients of the RSI [expansion unknown] was the French Shell company, for which the RSI founders had worked on the development of a refinery simulator. Other contracts then followed, either for the same client, for the modelization of a boiler system and the energy network of a refinery, or for the research center of Elf and the French Petroleum Institute, developing optimization software in a total energy management program.

In 1975 Daniel de Pinho founded Microtec. A year later he developed a computer that can handle the manufacture of photo envelopes. His market: photographic development labs. "Today my equipment can handle the manufacture of an envelope in 3 seconds," explains Daniel de Pinho, who is more interested in well "targeted" products than in larger markets.

For the past 18 months, Microtec has been getting into something big. Working with a group of textile companies on an automation project for weaving machines, it has discovered both the size of

the market--a million looms all over the world--and the absence of any competitors. How could they help being enthusiastic when orders are already coming in (with the aid of the plan to modernize the French textile industry) even before the product is ready?

The final condition for success, and not one of the least important, is exports. Some time ago, the government criticized the French computer companies for their hesitation in dealing with foreign markets. Today the government is preaching the virtues of going back to the domestic market. "Nonsense," say people in computers, "France accounts for only 5 percent of the world market. And this market, which is really quite modest, is already crowded." So, not paying too much attention to the government's suggestions, they didn't wait for the reports on electronics to venture into foreign competition. Some are even moving successfully against some of the most prestigious computer companies in the world. For example, Matra-Datavision has no hesitation about listing its main competition in CAO: IBM, General Electric, and Computervision.

Exportable computer-related products are not in short supply. In some areas, France's technological advance is well recognized. "Speech synthesis and voice recognition may become export products. We have established contacts in the United States, Canada, and the Federal Republic of Germany to handle the distribution of our products. We are the only ones anywhere in the world to have developed a recognition card for isolated words. We also have a synthesis card for the same price as those offered by our American and Japanese competitors, but ours has better performances," says Michel Verel, the head of Wecsys.

Indirect exports, another method used, can produce sales all over the world and thereby strengthen the company's credentials in the domestic market. This is done by taking part in major contracts. Apsis, a computer engineering company which specializes in the development of real-time systems and products, a company headed by Claude Otrage, is concentrating on a small number of systems. Others grab an opportunity as it comes along.

For X-COM, a Grenoble company founded last year, this opportunity came with the "Mundial," the world soccer championship. The company signed a big contract with the Spanish radio and television system to supply and install teletext message composition and broadcasting equipment for an Antiope type of system. This system enabled television viewers to have printed information available on their television screens, information that could be constantly updated.

No market can be ignored, and even though one big contract is certainly welcome, it may not be enough to base an export policy on. Symag is aware of this. With its top of the line business microcomputers, it is in competition against Apple and Tandy, the two big names in microcomputers. And yet, this is a realistic attempt, since the market for business microcomputers is relatively uncrowded, in comparison with the market for personal computers. In 1981 the company made 20 percent of its sales in foreign markets, with sales in Italy, Switzerland, Belgium, and in the Soviet Union.

A recent contract for 4 million francs is for the delivery of 13 microcomputers in the 4000 series to North Yemen for its telephone service.

"We are trying to grow gradually, for we are still too little to move into the American market. Anyway, we prefer to have 30 percent of the North Yemen market rather than 0.002 percent of the market in the Federal Republic of Germany! The Third World is a new market, and so it is very open, and we have the best advantage for getting into that market: the quality of our service," points out Louis Balme, who at the age of 31, is the head of Symag. By the end of 1982, 30 percent of Symag's sales will be from exports; this is 10 percent more than last year.

Still in the field of microcomputers, but this time at the lower end of the line, Axel is now completing a new generation, 16-bit microcomputer to sell for 12,000 francs. This is a market of some interest, for it is relatively uncrowded. The international ambitions of the head of Axel, Georges Cottin, have no bounds. He has no hesitation about competing with the U.S. market. His 5 years of experience with Hewlett-Packard France let him get to know the Americans well and he has designed a method for moving into the biggest market in the world. "I decided to get into the U.S. market through the back door, so I wouldn't become known as 'the foreign competitor!'," he says.

Establishing a presence in Silicon Valley, having a representative there and buying components is essential. Afterwards, sales can begin. "Also," adds Georges Cottin, "I only sell the floppy disk which is adaptable to all machines. Today they buy one part of my product. In October, I will offer its extension, the microcomputer itself." Now that he has established a "technical community" with the Americans, Axel must now establish himself in a "commercial community."

The U.S. market is an object of desire for many people in computers. Syseca, after solidly establishing its software (Socrate) in France, is now moving into the United States. "But our ambition is not restricted to the U.S. market," points out Georges Beaume, the head of the Syseca group in Grenoble, who also speaks of the markets in Abu Dhabi and Gabon.

Another method of moving into foreign territory is to establish subsidiaries. In 1981, 34 percent of Matra-Datavision's business was in the export market. Today its foreign sales figure stands at 50 percent, excluding subsidiaries. Subsidiary--the word is now out. "As soon as we have two clients in a foreign country, we open a subsidiary. So now we are present in the United States, in the Federal Republic of Germany, the United Kingdom, and Italy. In early 1983, we will open a subsidiary in Japan," Matra-Datavision says, which is now moving into a new phase.

Let there be no mistake about it; it is the world market which interests these young men. At any rate, they really don't have a choice, for to win back the domestic market they will need some foreign contracts. Also, their products must be adapted to the world market!

France doesn't lack ideas, particularly ideas about computers and related products. Jean-Luc Lagardere, the head of Matra, who last May issued an "appeal" to innovators, received 1,150 proposals for microcomputer projects. And not everyone answered! One of these was Jacques Deconchat, a math professor at Limoges and a computer enthusiast. This electronic game fan (he has just published two books on games adaptable to a programmable computer) has a secret dream: to compete with the Japanese in industry. "I intend to make contacts with industry," he explains, "for in the present electronic game market, games requiring thought are rare. All of them are based on physical reflexes. And we could make intelligent games."

There is no shortage of ideas or of people, and they are highly motivated. A new generation of industrialists is now being born in France's computer industry.

"Brain Valley"

At Meylan, 5 kilometers from Grenoble, 2,600 people are working in the ZIRST [Area for Innovation and Scientific and Technical Developments], which covers 60 hectares. Its promoters took as

their model Boston's Route 128 which has several hundred innovative companies established there. Its unique purpose is to house primarily companies oriented toward innovation and the advancement of research. Most of the 65 industrial units established there design products in related areas (electronics, computers), and sometimes compete with each other.

But competition does not exclude sharing and ongoing exchanges. It is true that they all know each other and watch each other, and competition has been transformed--a real sort of alchemy--into stimulation.

Another special feature established by its creators is control over the companies established there. Not everyone who wants to move in there can. The potential candidate's application is submitted to a selection panel on which some of the heads of companies in the ZIRST sit. They must evaluate the level of technology and innovation of the applicant.

Although more modest in size than its American counterpart, the French "Silicon Valley" (by analogy with California's Silicon Valley), continues to expand. It has just added another 10 hectares, which testifies to the ferment in computers and electronics in France.

Another innovation in management is an attractive formula for renting office space and industrial buildings. This lets some companies with limited financial resources minimize their risks. Through this "a la carte" rental system, a good number of data processing companies in the Meylan area have been able to add to their office space as their companies have grown.

The "coronation" of the ZIRST came last year. In 1981 the CNET [National Center for Telecommunications Research] moved into the area, occupying 8,000 m² of space. Of its 300 employees, 160 work on software. The CNET-Norbert Segard does research and development on printed circuits. Starting in 1985, it should move toward micron and submicron technologies, so that fast complex circuits can be developed. In addition, the CNET does research on equipment and technologies related to these new procedures. "This is a real success in futuristic architecture; it is the pride of the ZIRST," says one company director, adding with a wink of the eye: "It is also the external sign of the possibilities for financing that the government has."

The Offspring of the SEMS

With the SEMS [European Miniprocessing and Systems Company] and Hewlett-Packard, the Grenoble region houses two of the four plants in France that make minicomputers. There are 500 people at Echirolles and 200 at Crolles, making up the staff of the SEMS, which manufactures various lines of minicomputers.

1975, the year when the French data-processing industry was reorganized, certainly brought about a great many changes. The SEMS is the result of the merger of the minicomputer divisions of Telemecanique and CII-HB. Thomson, the main stockholder, wanted to make Echirolles the industrial and technical center of the SEMS. But the personnel at the plant opposed that decision. The engineers did not want the Echirolles facility to become an independent decision-making center including research, production, marketing, and sales.

At that time some of the engineers decided to set up their own companies. So Apsis, Peripherique Assistance, X-COM, and Telematique are all located just a few kilometers away at the ZIRST in Meylan. In most cases, part of their staff went with them. They are on good terms with their former employers, even developing complementary products. And in some cases, they even have their old employers as clients.

ANVAR, Support for Data Processing

The July 1979 reform made of the ANVAR a mechanism providing support for innovation. This organization has now strengthened its regional orientation. Starting in the summer of 1981, its regional representatives can now grant aid of up to 1 million francs. Its mission is also to bring together laboratories and companies, isolated inventors and innovators.

The new industries moving into data processing have often relied on ANVAR's services as a financial backup. And ANVAR has also enabled some older companies to get their second wind by creating new products. For example, Subra, a distributor of laboratory equipment in Toulouse, has since 1980 been producing equipment to study the viscosity of liquids. The prototype for this equipment was developed by the University of Toulouse. For this operation, the ANVAR helped by bringing the parties together and providing financing. It was also through the assistance of ANVAR and the arrival of a data processing specialist that Ruggieri (a fireworks company) developed its Promic-System, which varies the speed of AC motors, and thus brought about its diversification to data processing activities.

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CSO: 5500/2359

BRIEFS

EXPERIMENTAL DATA BANK--A pilot experiment in telematics, unique of its kind at the national level, has just been started in the Centre region at the initiative of the regional chamber of commerce and industry (CRCI), and of the New Republic of Centre-Ouest. With the exceptionally strong support of the General Directorate for Telecommunications, it concerns the enterprises of the region, and by next spring will result in the installation of 300 terminals (of which 150 in Indre-et-Loire and 140 in Loiret). The user enterprises will be connected by a simple telephone line to a central computer installed at the Tours Operations Directorate for Telecommunications, whose memory will have a data bank that contains economic, financial, legal, and practical information, stored and updated daily by CRCI and the New Republic. The experiment, which will continue for one year, will be capped by a telematics test aimed at the public, with New Republic installing two terminals at its agencies in Orleans and Tours, while awaiting the arrival at the center, of the electronic directory which will open the field of telematics to all private parties. In associating themselves with this experiment, CRCI as well as the Tours daily paper, have combined two complementary areas of expertise. The chamber of commerce is in direct contact with industry and knows its needs better than anyone, while New Republic, an information specialist, finds an application of the multimedia strategy that it pursues, wishing to be a part of the changes that are taking place. [Text] [Paris LES ECHOS in French 23 Sep 82 p 10] 11,023

JEUMONT-SCHNEIDER DIVERSIFIES--Jeumont-Schneider (of the Empain-Schneider group, with 3 billion in CA [turnover], and 15,000 employees), is increasing its diversification into electronics. Now, after its work on telephone systems, the group is moving into office automation. Two agreements (which have just been approved by the government) will further this strategic decision. Jeumont-Schneider has assured itself of its control of the appropriate technology by purchasing shares in the U.S. company, Micro-Five, and it is obtaining a commercial network by joining in association with the French SSCI [Company for Service and Consultation in Data Processing], SG 2. [Text] [Paris L'USINE NOUVELLE in French 16 Sep 82 p 85] 7679

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DIRECT BROADCAST TV SATELLITE PLANNED

Madrid ABC in Spanish 20 Sep 82 p 56

[Article by Agustin del Moral]

[Text] The difficulty in covering Spanish territory with the RTVE [Directorate General of Radio Broadcasting and Television] network of relays due to orographic problems has caused the responsible officials to start preliminary studies on an ambitious project of direct radio transmission by satellite.

The high frequencies which are normally needed to transmit TV signals cause difficulties in their dissemination in that they are unable to get past obstacles. For this reason the range of a repeater is virtually limited to the line of sight and for this reason mountainous areas and towns located in hollows and valleys are blocked off from the repeaters. In order to achieve an effective network which covers each and every town, village or neighborhood, one would have to locate a repeater on every hill or on almost every hill, which would mean a high cost for installation and especially a high cost for maintenance.

For this reason RTVE is considering a very ambitious solution which in the long run would be much cheaper and more effective. It would be something like hanging a repeater from the stars. It would be in an orbital position which would coincide with the one assigned to Portugal, Great Britain, Ireland and countries of the African cone by the ITU [International Telecommunications Union] Conference in Geneva.

This system has something of a precedent in the United States where there are in operation more than 2,000 ground stations which receive the signal by satellite and distribute it by cable to more than 5 million homes. Some handyman users have built their own antennas and receive the signal directly in their homes.

Spanish Technology

The Spanish satellite will use Spanish technology. This is not the first time that Spain has launched herself into the adventure of space. It will be recalled that INTELSAT was the first satellite of Spanish design and manufacture.

It was manufactured with the cooperation of Aeronautical Construction [Construcciones Aeronauticas] and Standard Electric [Standard Electrica] under the direction of INTE, the Aerospace Technical Institute.

The Electric and Information Division [Division de Electrica e Informatica] of the National Industrial Institute is participating in this project of direct radio transmission by satellite through its enterprise Piher Electronica which is working on the development of the technology applicable to the Spanish direct TV satellite which will be tried out in the Prosat project. This project serves, by satellite, the communications network for movement by air, land and sea.

The technology which was developed for the Prosat project would not only be usable but can also be improved by the miniaturization of that equipment, made possible by the increasing integration of electronic components.

On TV channel 2 transmission is at a frequency of about 54 MHz which is equivalent to a wave length of 5 meters. If this, which is the greatest wave length used in the transmission of TV signals, has difficulty in getting past obstacles, the UHF, which are 10 times smaller, that is, less than 1/2 meter, have even more difficulty. They require a relationship between transmitter and receptor which is even closer to the line of sight. Obstacles which could be overcome on the VHF cannot be overcome on UHF. Herein lies the big advantage of having a transmitter at such a height that it would be visible from all points in Spain--visible, in the figurative sense, since at a height of 34,000 km at which it would be fixed in a geostationary orbit on the equator, one would have to have exceedingly good eyesight in order to see it. As a very simple reference for approximating its position, one could say that it would be in a southerly direction and 4 or 5 hours above the horizon, measuring each hour as the width of one's hand with one's arm outstretched.

Although the waves sent from the satellite appear not to encounter obstacles in reaching the ground, in reality they can be weakened by large raindrops or hail pellets of approximately the same size.

In any event, these minor difficulties are neither so many nor so frequent as to nullify or occasion the slightest objection to the system of TV directly from a satellite which is much superior to the ground systems.

New Antennas

The difference in size between the VHF and the UHF antennas is due to the wave length in which they are transmitted. With direct TV, when the frequency is changed, the antennas will of course have to be adjusted and made the proper size in keeping with the new wave length and also the strength of signal one wishes to obtain.

There will be a charge to the user who prefers or needs to use the direct signal, depending on the degree of community participation or the amount of subsidy obtained. A parabolic receiver could be installed in a town or

neighborhood and then the transmission could be sent by cable to the various homes, retransmitting it at a frequency that is accessible to present television sets. Many solutions will surface in due course among which, of course, is the one which the very name of the system suggests: the installation of an individual parabolic antenna which carries the signal directly to the television set, but in this case the set should have the capacity to receive the higher frequencies. The new television sets, which are in the stage of being researched by the specialized firms of INI [National Institute of Industry] RTVE and the TS School of Telecommunications Engineers will be similar to present sets in price.

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